

### **REMARKS**

Claims 1-46 are pending. Claims 1, 12, 20, 31, and 41 are in independent form.

#### ***Rejections under 35 U.S.C. § 103(a)***

In the office action mailed April 16, 2009, claims 1 and 20 were rejected under 35 U.S.C. § 103(a) as obvious over a combination of the following four references:

- U.S. Patent No. 6,101,515 to Wical et al. (hereinafter "Wical '515");
- U.S. Patent No. 6,038,560 to Wical et al. (hereinafter "Wical '560");
- U.S. Patent No. 5,806,060 to Borgida et al. (hereinafter "Borgida"); and
- U.S. Patent No. 5,930,788 to Wical et al. (hereinafter "Wical '788").

As amended, claim 1 relates to a machine-implemented method that includes *inter alia*:

-receiving a first related term and a second related term associated with the primary term and representing a new first concept to be created in an existing machine-readable network of interrelated concepts,

-a semantic engine creating the new first concept in the existing machine-readable network of interrelated concepts to expand the existing network of interrelated concepts by adding the new first concept to the existing network of interrelated concepts;

-creating the new first concept comprises adding the primary term, the first and the second related terms, the relationship between the first concept and the second concept, the relationship type, and the strength value to the existing machine-readable network of interrelated concepts to represent the new first concept and the relationship between the first concept and the second concept;

-the first related term and the second related term are synonyms and the related terms define the first new concept as members of the group of synonyms that defines the first new concept.

The rejections of claims 1 and 20 contend that it would have been obvious for one of ordinary skill to have combined four different references, namely, Wical '515, Wical '560, Borgida, and Wical '788, and to have arrived at these features, and other features of the recited subject matter.

Applicant respectfully disagrees. Both claims 1 and 20 relate to the addition of a concept to a machine-readable network of interrelated concepts. Moreover, a user is involved in these additions. For example, claims 1 and 20 both recite that a primary term, a first related term, and a second related term that represent the same first concept are received from a user and added to a machine-readable network of interrelated concepts. The first and the second related terms are synonyms and define the first new concept as members of a group of synonyms that defines the first new concept. Further, a relationship type and a strength value are also added.

Applicant submits that none of Wical '515, Wical '560, Borgida, and Wical '788 describe or suggest such an addition of a concept to a machine-readable network of interrelated concepts. Accordingly, none of Wical '515, Wical '560, Borgida, and Wical '788 would make the recited addition obvious to those of ordinary skill.

For example, Borgida describes a system in which a knowledge base management system is used in conjunction with a data base management system to create a "virtual data base management system." *See, e.g., Borgida*, col. 4, line 56-61. According to Borgida, the retrieval of information from data base management systems using queries is often difficult. For example,

query languages are not simple, schema are complex, and the formulation of queries often requires detailed understanding of both the query language and the schema. *See, e.g., Borgida*, col. 1, line 50 – col. 2, line 34.

Borgida describes that a virtual data base management system can be used to obtain data from a data base management system using a schema and a query language that are independent of the schema and query languages used in the data base management system itself. *See, e.g., id.*, col. 5, line 1-7. In particular, data can be obtained using “concepts” in a knowledge base system that are pertinent to the domain being investigated. *See, e.g., id.*, col. 5, line 13-19. Further, these “concepts” can be used directly in the queries. *See, e.g., id.* One of the reasons that Borgida takes this approach is the ability to “incorporate new concepts” into the knowledge base system. *See, e.g., id.*, col. 5, line 20-22.

Even if one of ordinary skill were to consider Borgida’s “concepts” to comprise normalized semantic representations (a contention with which applicant disagrees), Borgida neither describes nor suggests that these “concepts” are defined by a group of synonyms, can be represented by a primary term, a first related term, and a second related term, or that incorporation of Borgida’s “concepts” into a knowledge base system includes adding such a primary term, a first related term, and a second related term,, along with a relationship type and a strength value, as recited in claims 1 and 20. Indeed, this failure appears to be relates to the both the structure of Borgida’s knowledge base system and the use of the knowledge base system to obtain data from a data base management system.

In this regard, Borgida's knowledge base system is preferably implemented using the CLASSIC description language-based knowledge base management system. *See, e.g., id.*, col. 6, line 32-36. Borgida describes that "concepts" are ordered based on a single type of relationship that lack strength values (i.e., a subsumption relationship). Further, Borgida's concepts are not represented or defined by a group of synonyms received from a user. Instead:

"[d]escription language-based knowledge base management systems take descriptions of concepts or of individual objects which are written in a description language and classify the concepts or the individual objects, that is, they find their relationship to all of the concepts or individual objects which are already in the data base. Classification relies on the ability of the knowledge base management system to find a generalization (or subsumption) relationship between any pair of terms expressed in the description language. Classification finds all previously-specified descriptions that are more general (i.e., that subsume) the new one, and all previously-specified descriptions that are more specific (i.e., that are subsumed by) the new one. They can find which of the more general ones are most specific, and which of the more specific ones are the most general, and place the new one in between those. This yields a generalization ordering among the descriptions—a partial ordering based on the subsumption relationship. The partial ordering may be thought of as a hierarchy, although most description languages permit any description to have multiple more general descriptions, and thus do not yield a strictly hierarchical ordering." *See id.*, col. 6, line 36-57 (emphasis added).

Thus, "concepts" in Borgida's knowledge base management system are ordered based on a single type of relationship (i.e., subsumption relationships). *See also id.*, col. 7, line 14-40 (describing example subsumption relationships); col. 7, line 41-59 (describing the integration of a "new concept into the hierarchy of concepts"). Further, there is no description or suggestion that these subsumption relationships are characterized via a strength value, as recited of the relationships between concepts in claims 1 and 20. Indeed, the use of a "strength value" would appear incongruous in the context of subsumption relationships. For example, the "concepts" "mother," "father," "customer," and "New Yorker" are all subsumed by the concept "person." *See, e.g., Borgida*, col. 7, line 16-40. Applicant is at a loss to understand how a relationship type

or a strength value can be assigned to relationships between these “concepts” and “person.” In particular, mothers, fathers, customers, and even New Yorkers are all understood to be persons in the same way.

Perhaps unsurprisingly, the incorporation of new “concepts” into Borgida’s knowledge base management system reflects these characteristics. In this regard, Borgida describes that a user can define these “concepts” in the knowledge base management system either directly or by specifying a collection to be converted into a concept. *See, e.g., id.*, col. 8, line 23-28. In the case of a directly defined “concept,” a classifier simply does the reclassification necessary to add the new concept to the hierarchy of “concepts.” *See, e.g., id.*, col. 8, line 28-31. In the case of a “concept” defined by means of a collection, a query processor makes a new “concept” from the collection and provides it to classifier for addition into the hierarchy of “concepts.” *See, e.g., id.*, col. 8, line 31-33.

Borgida describes the definition of a “concept” by means of a collection, and the addition of such a “concept,” in cols. 8- 10. In brief, after a user defines a conceptual query, the conceptual query is translated into a “collection specifier 511” and individuals that are specified by the collection specifier are collected. *See, e.g., id.*, col. 9, line 1-5, 21-24, 25-36. If a user finds the collection of individuals to be particularly useful for analysis purposes, the collection specifier 511 can be made into a permanent part of the hierarchy of “concepts.” *See, e.g., id.*, col. 9, line 44-47; col. 10, line 59-67.

Thus, not only do the “concepts” in Borgida’s knowledge base management system differ fundamentally from the concepts recited in claims 1 and 20, the incorporation of these “concepts” into the knowledge base management system also differs from the addition of a concept to a network of interrelated concepts, as recited in claims 1 and 20. As discussed above, claims 1 and 20 both recite that a primary term, a first related term, and a second related term

that represent the same first concept are received from a user and added to a machine-readable network of interrelated concepts. Further, claims 1 and 20 both recite that a relationship type and a strength value are also added.

The remaining cited references (i.e., Wical '515, Wical '560, and Wical '788) do not remedy these deficiencies in Borgida. In this regard, Wical '515 is primarily concerned with the classification of terminology using a knowledge catalog. *See Wical '515*, entitled "Learning System for Classification of Terminology." Wical '560 is primarily concerned with a search system that uses a knowledge base. *See Wical '560*, entitled "Concept Knowledge Base Search and Retrieval System." Wical '788 is primarily concerned with disambiguating and validating categories that have been preliminarily classified for terms in a document using a knowledge base. *See Wical '788*, entitled "Disambiguation of Themes in a Document Classification System."

Perhaps unsurprisingly, Wical '515, Wical '560, and Wical '788 describe many features that are not related to the addition of a concept to a network of interrelated concepts at all. The present rejections ignore this and instead contend that these unrelated features render the recited subject matter obvious.

An example of this is found in the Response to Arguments in the Office action mailed April 16, 2009. In particular, it is contended that:

"Wical '515 discloses that '[t]he content process system 110 may associate [more than] one category for a single word or phrase from a single document, depending upon the use of the word or phrase in the document.' See Wical'515, col. 9, lines 3-8. That is, wherein a single word or phrase (i.e. a primary term) may be associated with a category (i.e. a concept), Wical would indeed read upon the present invention as claimed." *See Office action mailed April 16, 2009*, p. 9.

As a threshold matter, the cited excerpt from Wical relates to the analysis and classification of themes and content carrying words in the knowledge catalog 150 based on their use in a document. *See, e.g., Wical*, col. 8, line 66-col. 9, line 3. Wical does not consider a single word or phrase to be a concept, nor would those of ordinary skill modify Borgida's knowledge base management system based on Wical's association of a word or phrase into more than one category, depending upon the use of the word or phrase in the document.

Thus, for the reasons set forth above and in the Responses filed January 26, 2009, February 4, 2008, July 1, 2008, and September 2, 2008, claims 1 and 20 are not obvious over Wical '515, Wical '560, Borgida, and Wical '788. Applicant respectfully requests that the rejections of claims 1, 20, and the claims dependent therefrom be withdrawn.

Claims 12 and 31 were rejected under 35 U.S.C. § 103(a) as obvious over a combination of the following three references:

- U.S. Patent No. 6,101,515 to Wical et al. (hereinafter "Wical '515");
- U.S. Patent No. 6,038,560 to Wical et al. (hereinafter "Wical '560"); and
- U.S. Patent No. 5,806,060 to Borgida et al. (hereinafter "Borgida").

As amended, claim 12 relates to a machine-implemented method. The method includes receiving, from a user interacting with a user interface of a client processor, a request to edit a first concept in an existing machine-readable network of interrelated concepts, wherein a concept comprises a normalized semantic representation and is defined, in an ontology, by a group of synonyms, representing the first concept on a display of the user interface for the user, including displaying a first collection of synonyms that define the first concept and a description of one or more existing relationships between the first concept and other concepts in the existing machine-readable network of interrelated concepts, receiving, from the user interacting with the user interface, at least one new relationship between the first concept and a second concept, receiving, from the user

interacting with the user interface, a relationship type characterizing a type of the at least one new relationship, receiving, from the user interacting with the user interface, a strength value characterizing a strength of the at least one new relationship and a semantic engine updating the machine-readable network of interrelated concepts to reflect the at least one new relationship, the relationship type, and the strength value representing the updated first concept on the display for the user

Claim 31 relates to one or more computer-readable storage devices comprising program code tangibly embodied in machine-readable format and operable to cause one or more machines to perform operations. The operations are related to the activities of claim 12.

The rejections of claims 12 and 31 are based on the contention that requests to verify classifications of terminology in Wical '515 constitute a request to edit a concept in a network of interrelated concepts. Applicant respectfully disagrees. As shown above, the claims recite that a concept comprises a normalized semantic representation defined by a group of synonyms. The terminology that is learned and classified in Wical '515 is not such "concepts," much less normalized semantic representations that is defined by a group of synonyms. Instead, terminology in Wical '515 is individual words or phrases. *See, e.g., Wical '515*, col. 3, line 14-17. An individual word or phrase is not a normalized semantic representations, much less defined by a group of synonyms.

Further, Wical '515 itself acknowledges this distinction between concepts and terminology. For example, Wical '515 distinguishes between the terminology that is learned and classified and a knowledge catalog 150 that is used in these processes. Wical '515's knowledge catalog 150 includes a set of static ontologies. *See, e.g., Wical '515*, col. 7, line 37-39. These static ontologies provide views of views, characterizations, and organizations of concepts or categories. *Id.*, col. 7, line 39-42. Wical '515's learning and classification of terminology does



not change these static ontologies, which is perhaps unsurprising since the learned and classified terminology are not concepts or categories that comprise normalized semantic representations of the sort found in an ontology.

Because Wical '515 does not consider its terminology to constitute concepts or categories, such as those found in its static ontologies, one of ordinary skill would also not reasonably consider Wical '515's terminology to be concepts, as recited. Indeed, the Examiner's continued insistence on ignoring the teachings of not only Applicant's specification but also the teachings of Wical '515 is improper. The impropriety is apparent when the Response to Arguments in the Office action mailed April 16, 2009 are considered in more detail. In particular, it is contended that:

"It is noted that under the broadest reasonable interpretation of 'a normalized semantic representation,' it would have been obvious to one of ordinary skill in the art that the categories in the knowledge catalog of Wical '515 would indeed read upon the claimed feature.." See *Office action mailed April 16, 2009*, p. 9.

As a threshold matter, the rejection does not contend that categories in Wical '515 are concepts. Instead, the rejection contends that terms in Wical '515 are concepts. Indeed, Wical '515's knowledge catalog 150 includes a set of static ontologies. See, e.g., *Wical '515*, col. 7, line 37-39. Concepts are not added to a static ontology, nor does the existence of a static ontology lead those of ordinary skill to make the allegedly obvious modifications to Borgida.

Even if the Response to Arguments intended to contend that the terminology that is classified by Wical '515 is concepts, the rejection remains improper. For example, the "broadest reasonable interpretation" standard relied upon by the rejection states that the interpretation is to be "consistent with the specification." See, e.g., *M.P.E.P.* § 2111 (*citing Phillips v. AWH Corp.*, 415 F.3d 1303

(Fed. Cir. 2005)). Since the contention that terms in Wical '515 are concepts is inconsistent both with the specification and with Wical '515, it is unreasonable and cannot serve as the basis for the rejection.

Further, as shown above, claims 12 and 31 have been amended to clarify that concepts are "defined by a group of synonyms." Even if the classified terms in Wical '515 were somehow considered to be concepts, the terms are not defined in an ontology by a group of synonyms.

Accordingly, since Wical '515's terminology are not concepts, Wical '515 does not describe or suggest a number of features recited in claims 12 and 31. For example, Wical '515 neither describes nor suggests that a request to edit a first concept in a network of interrelated concepts be received from a user. As another example, Wical '515 neither describes nor suggests that at least one new relationship between a first concept in a network of interrelated concepts and a second concept be received.

Borgida and Wical '560 do not remedy these deficiencies. In this regard, as discussed above, the primary concern of Wical '560 is a search system that uses a knowledge base. According to Wical '560, a knowledge base can include a plurality of categories and terminology that are arranged hierarchically. *See, e.g., Wical '560*, col. 2, line 54-55. A knowledge base can be augmented to include contextual information (e.g., associations). *See, e.g., Wical '560*, col. 6, line 8-13. FIG. 4 of Wical '560 illustrates an example portion of such a knowledge base. *See, e.g., Wical '560*, col. 3, line 27-28.

Wical '560 describes that its search system "permits a user to subsequently augment the classification and contextual information [of the knowledge base] through content processing of the documents input by the user." *See, e.g., Wical '560*, col. 6, line 17-20. It is this

augmentation to which the rejections point as allegedly constituting the receipt of a new relationship between first and second concepts, as recited in claims 12 and 31. *See Office Action mailed October 3, 2007*, page 6, second paragraph (citing Wical '560, col. 6, line 7-21).

Applicant respectfully disagrees. In this regard, attention is respectfully directed to the description of "content processing" in Wical '560. *See Wical '560*, col. 27, line 14-col. 31, line 31. Wical '560's content processing system includes a linguistic engine 700, a structured output section 710, a theme vector processor 750, and a content indexing processor 770. *See, e.g., Wical '560*, FIG. 13; col. 27, line 15-21. This system receives a set of documents 130 as input. *See, e.g., Wical '560*, FIG. 13; col. 27, line 22-23. The content processing system takes the documents, tags them using contextual, thematic, and stylistic tags, extracts topics and content carrying words, and generates theme concepts and document theme vectors.

Based on this processing, content indexing processor 770 can develop new categories in a classification hierarchy. *See, e.g., Wical '560*, FIG. 13; col. 27, line 22-23. In particular, content indexing processor 770 uses contextual tags and thematic tags to identify head words that represent the content-carrying words in the documents. *See, e.g., Wical '560*, col. 30, line 16-27. At least one contextual relationship for each head word is noted. *See, e.g., Wical '560*, col. 30, line 30-31. The head words and their contextual relationships are used to arrange a hierarchical structure of "new categories," which is mapped to the pre-existing categories of the classification hierarchy. *See, e.g., Wical '560*, col. 30, line 40-43. In this way, indexing processor 770 can develop new categories to extend the pre-existing categories of a knowledge base 155. *See, e.g., Wical '560*, col. 30, line 35-47.

Applicant respectfully submits that such a development of new categories in a knowledge base by Wical '560's content processing system neither describes nor suggests that a request to edit a first concept in a network of interrelated concepts be received from a user, or that at least one new relationship between a first concept in a network of interrelated concepts and a second concept be received. For example, Wical '560's content processing is not understood to involve a request to edit concepts at all. Instead, Wical '560's content processing develops new categories based the mapping of the new category hierarchy to the pre-existing category hierarchy. Moreover, there is nothing that describes or suggests that new relationships for existing concepts in a network of interrelated concepts can be received. Instead, Wical '560 appears to be solely concerned with the development of new categories.

As for Borgida, Borgida also neither nor suggests that his "concepts" can be edited, much less that a request to edit such a "concept" be received from a user. Furthermore, Borgida neither describes nor suggests that at least one new relationship between a first concept in a network of interrelated concepts and a second concept be received. Instead, Borgida describes that new "concepts" can be added, either directly by a user or by a user who specifies a collection to be converted into a "concept."

Borgida, Wical '515 and Wical '560 thus fail to describe or suggest the same features. Accordingly, even if Borgida, Wical '515 and Wical '560 were combined, one of ordinary skill would not arrive at the subject matter recited in claims 12 and 31. Accordingly, Applicant respectfully requests that the rejections of claims 12, 31, and the claims dependent therefrom be withdrawn.

Claim 41 was rejected under 35 U.S.C. § 103(a) as obvious over a combination of the following three references:

- U.S. Patent No. 6,101,515 to Wical et al. (hereinafter "Wical '515");
- U.S. Patent No. 6,038,560 to Wical et al. (hereinafter "Wical '560"); and
- U.S. Patent No. 5,806,060 to Borgida et al. (hereinafter "Borgida").

As amended, claim 41 relates to a user display that includes an identifier of a first concept in an existing machine-readable ontology of concepts, a list of two or more synonyms that represent the first concept, a list of two or more parent/child relationships between the first concept and other concepts in the ontology, a list of two or more child/parent relationships between the first concept and other concepts in the ontology, and a list of two or more lateral relationships between the first concept and other concepts in the ontology. A concept comprises a normalized semantic representation defined, in the ontology, by a collection of synonyms.

As discussed previously, none of Wical '515, Wical '560, and Borgida describe or suggest this subject matter. For example, claim 41 recites that, in addition to an identifier of a concept, a display includes lists of two or more terms that represent the concept, parent/child relationships, child/parent relationships, and lateral relationships. One example of such a display is shown in FIG. 4 of Applicant's specification. Such lists are believed to present significant advantages vis-à-vis Wical '560's hierarchical or directed graphs. In particular, as the number of terms representing a concept, the number of parent/child relationships, the number of child/parent relationships, and the number of lateral relationships increases, the recited display is believed to be much more adept at presenting information in a format that is accessible to a user.

Accordingly, claim 41 is not obvious over Borgida, Wical '515, and Wical '560. Applicant respectfully requests that the rejections of claims 41 and 42 be withdrawn.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue, or comment does not signify agreement with or concession of that rejection, issue, or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Please apply the fees for a Petition to Revive Under 37 C.F.R. § 1.137(b) and the Request for Continued Examination fees, along with any other charges or credits, to Deposit Account No. 06-1050.

Respectfully submitted,

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